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A european framework for digital literacy

Abstract

In the e-permeated society, “digital literacy” becomes a key factor in enabling participation in education, as well as employment and other aspects of social life. This paper gives an account of the DigEuLit project in defining digital literacy, and developing a digital literacy framework for use in European educational settings. Digital literacy is seen as based on a convergence of literacies – IT literacy, information literacy, technological literacy, media literacy, and visual literacy – as their relationship to the digital has become clearer. A model of digital literacy acquisition based on the use of digital competence within authentic life-situations and in the context of a set of generic processes has enabled the conceptualisation and subsequent implementation of a set of tools which will allow educators to map digital literacy elements of courses and allow students to monitor and reflect upon their own development as digitally literate persons.

Introduction

The DigEuLit project was proposed as a response to a call for actions on “digital literacy” in the context of the eLearning Programme of the European Commission. One of the four key strands of the programme is the promotion of “digital literacy”:

The ability to use ICT and the Internet becomes a new form of literacy – “digital literacy”. Digital literacy is fast becoming a prerequisite for creativity, innovation and entrepreneurship and without it citizens can neither participate fully in society nor acquire the skills and knowledge necessary to live in the 21st century. (European Commission, 2003: 3)

The goal of DigEuLit is to develop a European Framework for Digital Literacy (EFDL): a definition, generic structure, and set of tools which will enable educators, trainers and learners to share an understanding of what constitutes digital literacy and how it can be mapped into European educational practice.

Background

Digital literacy is the ability to succeed in encounters with the electronic infrastructures and tools that make possible the world of the twenty-first century. Digital literacy has become a central enabling agent in the educational enterprise as a result of a number of trends. The most significant is simply that the world is becoming *e-permeated*. Electronic devices and facilities now underpin the practice of most sectors of society and most human activities. Those who can understand and comfortably use e-facilities are significantly empowered and advantaged, in terms of educational success, employment prospects and other aspects of life.

Education, like other social sectors, is rapidly adopting electronic means. But the evolution of electronic tools for education has run alongside, and been to some extent fuelled by, a paradigm shift in approaches to learning and teaching. In moving towards student-centred and constructivist learning models, electronic tools are seen as key factors in realising learning environments. Mastery of the tools thus becomes an entitlement for the student if she is to learn successfully. Education is also driven by processes of outreach and globalisation, the one driven by ideologies of inclusion, the other by ideologies of the market. The effect of both is to press forward the need for education at a distance, making remote the bond between student and teacher and between student and student. Digital tools are crucial in enabling the community of remote learners, students and teachers who are geographically distributed, and yet are able to learn together. Mastery of the tools is central to the success of this enterprise.

Education has since the Middle Ages been based on the model of disciplines, uniting groups of scholars sharing an area of content and a methodology for studying it. But it is recognised that there are generic skills to which all scholars, and by extension all educated persons, should aspire. Some of these are simply expressed – reading, writing, counting – whilst others are harder to specify – analytical thinking, or the awareness of bias. The trend towards student-centred educational models, as well as the drive to involve more of the population in higher education, has raised the importance of generic skills issues; and in the e-permeated world, the claim of digital literacy to be recognised as an essential generic skill.

Multiple literacies confront educators, students and citizens in the digital era. Computer (IT) literacy has developed since the 1970s; information, media and visual literacy are as old, although initially not focused on digital areas; and more recently the *e* prefix has joined many neologisms. There is much action at the level of practice, but the landscape is unclear; teachers are not sure about what they could achieve in making students confident for digitally infused education and the e-world beyond. There is a need to clarify terms and develop a framework which will enable providers and consumers to locate their actions and achievements within a landscape of intellectual development in the contexts of social and technological trends and of European awareness and mobility.

The EU has a key role to play in the transformation of Europe as a political, economic and social entity, and its educational structures and practices. EU programmes aid transformation by presenting models to think about and tools to effect change. They do not always succeed, but perhaps enough do to make it worthwhile. It is thus understandable that the EC eLearning Initiative should address the digital enablement of students and teachers. This offers major benefits to education, and thence to employment and other areas of life. Digital literacy is not merely an educational issue, but one that confronts all dimensions of the digitally-infused world.

Aims and Actions

The aim of the Project is threefold: to map out the conceptual landscape surrounding digital literacy; to develop a framework for digital literacy, applicable across Europe, onto which existing and planned programmes can be mapped, and which would enable portability of qualifications; and to specify the elements of a toolkit which support providers of digital literacy. The framework should be applicable to any groups at whom digital literacy activity is directed, as well as providers of this activity, and those (e.g. employers) for whom acquisition of digital literacy is important. Work in this area is often fragmentary or focused on low-level skills at the expense of understanding, and there is need to locate digital literacy securely in a conceptual context. The digital literacy toolkit will offer tools which will be of direct value to the target groups in shaping and sustaining digital literacy provision. Policymakers and administrators at local/regional/national level may also use the framework to harmonise curricula in terms of digital literacy content. The assumption is made by the project partners that learning is a constructive, a reflective and a social activity. This perspective will influence the exploration of concepts, construction of the framework, and specification of the toolkit.

The project is divided into four phases:

- I. **Mapping the Landscape:** this involves examining existing literature in this area, identifying relevant projects, research and practical actions, analysing the results of this work and laying out the concepts and issues involved. This work will culminate in a working definition of digital literacy, to form the basis for construction of a framework.
- II. **Building the Framework:** from the key concepts developed in Phase I, a framework for digital literacy can be constructed, appropriate to all users. Tools will be specified which will enable users to employ the framework on existing or proposed courses or other educational actions, and sample tools will be created. Strategic, training, resource and other implications will be identified.

- III. Testing the Framework:** successful actions in the digital literacy area will be reported, focusing on examples of actions which demonstrate the application of the framework, and which show the use of the sample tools with a range of target groups.
- IV. Dissemination:** discussion about and use of the framework and sample tools will be encouraged through workshops, publications, and web activity. The project products will be made available to potential users through the website. Experience gained through the project will be fed back to national and European levels. Issues and possibilities for sustainability of the Framework will be discussed. Reports will be submitted to the EC, presentations on the project will be made at selected conferences, and reports or papers submitted to relevant publications.

Defining Digital Literacy

We view digital literacy as a broad concept which encompasses digitally-related activity of many sorts. To approach a concept of digital literacy, we have drawn upon a number of converging literacies which have gained new or increased relevance with the emergence of digital environments: ICT literacy, information literacy, technological literacy, media literacy, and visual literacy. Apart from ICT Literacy, they have originated in the pre-digital world, but have successfully been able to draw digital activities within their ambits, and, while regarding the digital as not the only possible mode of activity, have yet recognised that the digital has had a transformational impact upon the practices on which they are focused. Each has evolved from a focus on specific skills towards a realisation that literacy is a more integrative and sophisticated quality, concerned with the deployment of skills and competences through generic processes in the context of real-life tasks or problems. The culture of the digital environment may encourage a convergence, as practitioners in the different areas relate their activity to the digital environment and the “information society”. The convergence of ICT and information literacies has been encouraged also by organisational changes in educational institutions, where IT support services and libraries have been brought closer together, sometimes into a single organisational unit. (For fuller discussion, see Martin, 2006a)

On the basis of the work in Phase I of the project, we proposed that the concept *digital literacy* would include several key elements:

1. Digital literacy involves being able to carry out successful digital actions embedded within life situations, which may include work, learning, leisure, and other aspects of everyday life;
2. Digital literacy, for the individual, will therefore vary according to his/her particular life situation, and also be an ongoing lifelong process developing as the individual’s life situation evolves;

3. Digital literacy is broader than ICT literacy and will include elements drawn from several related “literacies”, such as information literacy, media literacy and visual literacy;
4. Digital literacy will involve acquiring and using knowledge, techniques, attitudes and personal qualities, and will include the ability to plan, execute and evaluate digital actions in the solution of life tasks, and the ability to reflect on one’s own digital literacy development;

And we have therefore formulated the following brief definition:

Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.

In content terms, digital literacy is a broader concept than ICT literacy. It also includes elements of information literacy, media literacy, and visual literacy. In a minimal sense, all digital literacy rests upon elements of ICT literacy – the basic skills to operate digital hardware and software; yet those who only possess ICT skills cannot be considered digitally literate. There is more to even the most digitally embedded profession than ICT skills: it might be thought that a computer programmer might only require ICT literacy, yet, since the products of the programmer’s art are in today’s interfaces unavoidably visual, some ability in visual design is necessary (visual literacy), and since the programmer’s product will normally manipulate information for users, the programmer needs to be able to identify, access and assess that information (information literacy), and since the product will be used by non-programming users, the impact of the interface and the content upon the users must be considered (media literacy). All four literacies need to be deployed in some measure to form a fully digitally literate individual.

Stages of Digital Literacy

There are three “stages” or levels of engagement of digital literacy:

1. The foundation of the system is *digital competence*, consisting of knowledge, understandings, attitudes and skills relating to the digital. This will include a wide range of topics, and also a differentiation of skill levels. Individuals or groups will draw upon digital competence as is appropriate to their life situation, and return to it as new challenges are presented by the life situation.

2. The central and most crucial level is that of the application of digital competence within specific professional or domain contexts, giving rise to a corpus of *digital usages* specific to an individual, group or organisation, which forms part of the culture of the community. In generating digital usages, users draw upon relevant digital competence and expertise specific to the profession, domain or other context. Each user brings to this his/her own history and personal/professional development.
3. The uppermost level is that of *digital transformation*, and is achieved when the digital usages which have been developed enable innovation and creativity, and stimulate significant change within the professional or knowledge domain. This change could happen at the individual level, or at that of the group or organisation.

Users do not necessarily follow a sequential path at each level. They will draw upon whatever is relevant for the project they are currently addressing.

The process in which digital literacy is put into action is as follows. A task or problem arises out of the individual's life context; it may concern work, study, leisure, or any other aspect of the life context. In order to complete the task or to solve the problem, the individual identifies a *digital competence* requirement. He/she may then acquire the needed digital competence through whatever learning process is available and preferred. He/she can then make appropriate use of the acquired digital competence, within the context of the task, where it is informed and shaped by the knowledge and expertise pertaining to the professional or discipline context. The informed uses of digital competence within life-situations are termed *digital usages*. These involve using digital tools to seek, find and process information, and then to develop a product or solution addressing the task or problem. This outcome will itself be the trigger for further action. The drawing upon digital competence is determined by the individual's existing digital literacy and the requirements of the problem or task. *Digital usages are therefore fully embedded within the activity of the professional, discipline or domain community.*

The assertion of digital literacy for any person or group is always provisional. Digital literacy is an ongoing and dynamic process – it is not a threshold which, once achieved, guarantees familiarity with the digital for ever after; it is rather a temporary achievement which will be good as long as the current environment does not change. It is also dependent on the needs of the situation; when those needs change, what constitutes digital literacy for that situation may well change. Maintenance of digital literacy is therefore ongoing; it is necessary to return again and again to the well of digital competence (whose contents are themselves changing as technology evolves) to acquire the competence needed to succeed in the life-situation, whether it be learning, work or leisure. Digital literacy cannot therefore be certificated with a one-off diploma like a driver's licence; it must be mapped onto the situation of the individual, using a *personal development profile*. In this way the actual value of the competence elements acquired and their applica-

bility to situations relevant to the individual's study and career trajectory can be demonstrated. This is of obvious utility to the individual him/herself, to those whom manage their learning, and to those outwith the learning process for whom the possession of digital literacy is important, such as employers or potential employers. *Digital literacy is a condition, not a threshold.*

Components of the Framework

The framework is based upon drawing together the digital elements of ICT, and other digitally-relevant literacies, and viewing them through the organising perspective of thirteen processes, more-or-less sequential functions to be carried out with digital tools upon digital resources of any type, within the context of a specific task or problem. The problem or task may be in any area of activity: examples might include writing an essay, carrying out an experiment or field study, preparing a portfolio of material, and making a multimedia presentation. "Digital resources" are to be considered in the most inclusive way: a digital resource could be defined as any item which can be stored as a computer file. This could include text, images, graphics, video, music, and multimedia objects. Digital resources could take the specific form of reports, academic papers, fiction, pieces of music, art works, films, games, learning materials, data collections, etc. The first and last processes, *statement* and *reflection*, have a more generic status as mediating processes between digital usages and their context. The processes are:

- **statement:** state clearly the problem to be solved or task to be achieved and the actions required;
- **identification:** identify the digital resources required to solve a problem or complete a task;
- **accession:** locate and obtain the required digital resources;
- **evaluation:** assess the objectivity, accuracy, reliability and relevance of digital resources;
- **interpretation:** understand the meaning conveyed by a digital resource;
- **organisation:** organise and set out digital resources in a way that will enable the solution of the problem or achievement of the task;
- **integration:** bring digital resources together in combinations relevant to the problem or task;
- **analysis:** examine digital resources using concepts and models which will enable solution of the problem or achievement of the task;
- **synthesis:** recombine digital resources in new ways which will enable solution of the problem or achievement of the task;
- **creation:** create new knowledge objects, units of information, media products or other digital outputs which will contribute to solution of the problem or achievement of the task;
- **communication:** interact with relevant others whilst dealing with the problem or task;

- **dissemination:** present the solutions or outputs to relevant others;
- **reflection:** consider the success of the problem-solving or task-achievement process, and reflect upon one's own development as a digitally literate person.

The processes underlie the four key components of the framework (see Figure 1); each component takes the form of an online tool:

1. The **Digital Competence Content Reservoir** is maintained currently by the DigEuLit project partners, and indicates the range of digital competence elements which may be drawn upon by the EDLF tools. It is regularly updated centrally as technologies and applications change.
2. The **Digital Literacy Provision Profile** is completed by the course leader, and enables mapping of the provision which is being made for acquisition of appropriate digital competence and exercises where students can apply their digital competence in authentic situations, thereby gaining digital literacy. Having completed the profile, tutors know how digital competence is to be delivered, and can if necessary request provision from colleagues, other departments or central agencies.
3. The **Digital Competence Needs Analysis** enables the assessment of student progress in the digital competence elements identified in the Requirement Profile. Questions linked to each element in the Content reservoir are triggered from the Digital Competence Requirement Profile, so that, for instance, prior to the commencement of a course, students will be assessed with regard to the competence elements which are either pre-course requirements or in-course provision. Resultant information will alert tutors to the readiness of students for the course, and identify those already in possession of competence elements to be delivered during the course; it will also alert students to elements still needed and will offer them immediate registration to online modules enabling them to gain the required competence elements.
4. The **Digital Literacy Development Profile** enables each student to map their acquisition of digital competence and its application in authentic digital usages. The Development Profile has three elements:
 - a *learning log*, in which the achievement of digital competence elements and their usage in authentic situations is recorded; this might be automated, as when on completion of an online module, information on the student's success is passed by the course management system directly to the learning log;
 - b an *ePortfolio*, where documents and other files significant to the students digital literacy progress can be stored and organised;
 - c a *personal development profile for digital literacy*, where the student can plan their career and learning trajectory, and reflect on their own development as a digitally literate person.

Appropriate information from the digital literacy development profile can be sent to tutors, and to potential employers. The development profile will of benefit to the student in the employability context, in showing the progress make towards career goals and stimulating reflection on it.

(for further discussion of the framework and its components, see Martin, 2006b)

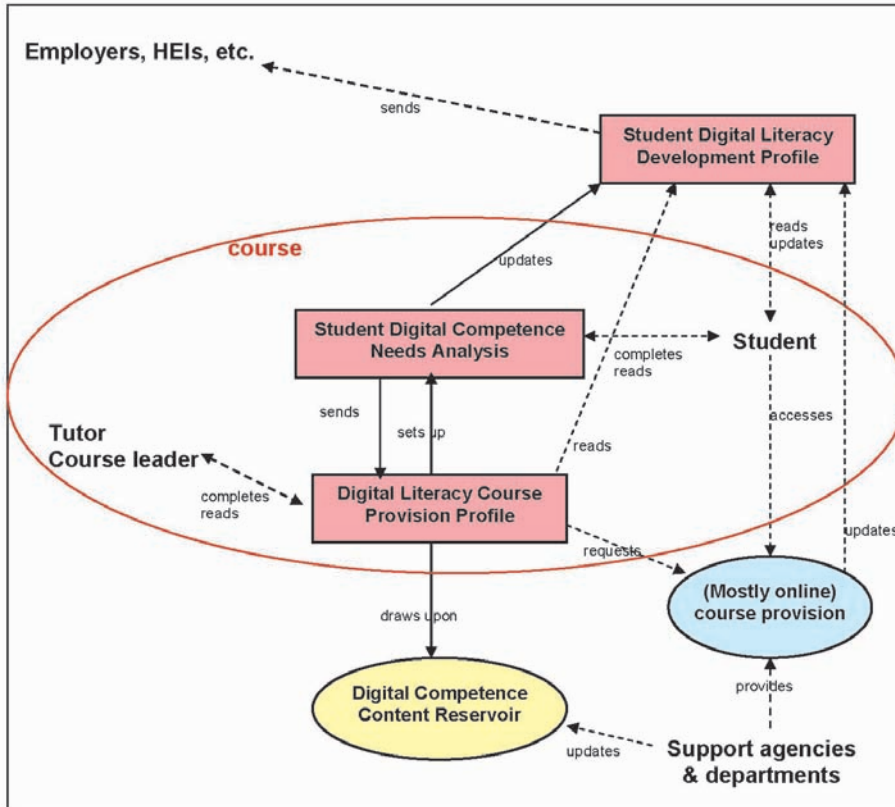


Figure 1. Implementation Map of the Digital Literacy Framework

Piloting the Framework

During the first half of 2006 a first pilot of the framework is being undertaken by the DigEuLit project partners. This involves preparing the tools, and inviting tutors and students, in institutions of further and higher education, to use them. The intention of this pilot is to gain experience with the tools in use, and to modify them in response to user feedback. This pilot is now giving an indication not only of how the tools are used, but also how positively (or otherwise) the framework is perceived, and what benefits it is felt

to bring. A further pilot is proposed for the second half of the year which will enable the framework and the tools to be reviewed, amended, and debugged. It is then intended that the system will be made available for general usage, although it will continue to develop and be elaborated and optimised. The results of the pilots will be published in due course.

Conclusion

The Polish sociologist Zygmunt Bauman presents us with a dystopian vision of a world descending, in the period of “liquid modernity” into a neo-Hobbesian jungle where nothing is long-term, nothing is fixed:

Society is being transformed by the passage from the “solid” to the “liquid” phases of modernity, in which all social forms melt faster than new ones can be cast. They are not given enough time to solidify, and cannot serve as the frame of reference for human actions and long-term life-strategies because their allegedly short life-expectation undermines efforts to develop a strategy that would require the consistent fulfilment of a “life-project.” (Bauman, 2005: 303; see also Bauman, 2000)

Digital technology, with its rapid rate of change, its appearance simultaneously in a million manifestations, and its facilitation of the instant – actions, images, communication, reinvention – plays an essential part in the liquefaction of structures of social practice and of meaning. With digital games, mobile phones and iPods, a growing generation of “digital natives” does not use digital technology to engage with reality, but to insulate themselves from it. Digital reality comes to seem more significant than actual reality – like “literacy”, “reality” becomes a relative term, suggesting a choice of realities, some that we seek, others from which we flee. In seeking frameworks to make sense of our involvement with the digital, we may enable individuals or groups to reflect on their own evolution in respect of the digital environment, and to put the technology which seems to dominate them into its place as the servant of social action. In this way, through critical awareness, we may be able to resist the unravelling of the social order, and recognise education as a factor in rebuilding engagement with the social fabric in a Europe-wide context.

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DigEuLit Project: Partners in the project, which runs from 1 January 2005 to 31 August 2006, are: University of Glasgow, Scotland (Lead Partner); Reid Kerr College, Paisley, Scotland; West Lothian College, Livingston, Scotland; Amtscentret for Undervisning – Sønderjylland, Aabenraa, Denmark; Centre for Videregående Uddannelser – Sønder-

jylland, Sønderborg, Denmark; Centre for Fleksibel Voksenuddannelse, Haderslev, Denmark; Business College Syd, Sønderborg, Denmark; Kainuun Ammattiopisto, Kajaani, Finland; Technical University of Łódź, Poland; Littérature, Idéologies, Représentations (LIRE), CNRS Lyon, France; and the University of Oslo, Norway. The project leader is Allan Martin, University of Glasgow. The project website is at www.digeulit.ec The project is supported by the eLearning Programme of the European Commission.